PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2004/036768	04.11.2004	21.11.2003

International Patent Classification (IPC) or both national classification and IPC
G06F11/36

Applicant
HONEYWELL INTERNATIONAL INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Authorized Officer

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International application No.
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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ in written format

   ☐ in computer readable form

   c. time of filing/furnishing:

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-20
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-20
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

2. Citations and explanations

see separate sheet

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Re Item V
Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: VESTAL S: "Assuring the correctness of automatically generated software" DIGITAL AVIONICS SYSTEMS CONFERENCE, 1994. 13TH DASC., AIAA/IEEE PHOENIX, AZ, USA 30 OCT.-3 NOV. 1994, NEW YORK, NY, USA,IEEE, 30 October 1994 (1994-10-30), pages 111-118, XP010127150 ISBN: 0-7803-2425-0

D2: US 2002/104072 A1 (ECKER WOLFGANG ET AL) 1 August 2002 (2002-08-01)

D3: WO 02/101544 A (THE SECRETARY OF STATE FOR DEFENCE; TUDOR, NICHOLAS, JAMES) 19 December 2002 (2002-12-19)

1. **Article 6 PCT**

The wording of claims **1,7,12** gives the impression that an expected computer code is generated. According to the description, it appears that the expected computer code rather refers to a database associating each block in the model with an expected computer code format ([27], [34], [36]). Finally, the description nowhere gives details on how to generate an "expected computer code".

The subject-matter of claim 1 is therefore supported with the description (Article 6 PCT).

For the assessment of novelty and inventive step, claim 1 can only be undersood with the assumption that each block in the model is associated with an expected format.

2. **Article 33 (3) PCT**

Furthermore, the above-mentioned lack of clarity notwithstanding, the subject-matter of claims **1-20** does not involve an inventive step in the sense of Article 33(3) PCT, and

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therefore the criteria of Article 33(1) PCT are not met.

2.1 Document **D1** is regarded as being the closest prior art and discloses (the references in parentheses applying to this document):

A method for verifying a generated computer code (p 112 left column l 30-35) having a plurality of lines generated from a model of a system (p 112 right column l 34-36, p 114 right column l 2-7) comprising
processing the model to determine for each objects in the model an expected code format (ControlH and MetaH translators process the model and inherently contain translation rules as well as rules to preserve the overall structure of the generated code, see p 115 right column l 5-10, p 116 right column l 51 - p 117 left column l 4)

The subject-matter of claim 1 therefore differs from this known D1 in that the method comprises a step of comparing the generated computer code to the expected computer code to determine whether the computer code includes all of the lines of the expected computer code.

The objective technical problem to be solved by the present invention may therefore be regarded as how to quickly evaluate the correctness of the generated code.

Verifying the correctness of the generated code in D1 means in particular tracing relationships between the structure of the generated program and the model (p 115 left column l 21-25, 41-48).
The idea that the tracing tool verifies beforehand that the blocks in the model that were expected to generate code did generate code, would correspond to a normal design option for the man skilled in the art.

The subject-matter of claim 1 therefore does not involve an inventive step (Article 33 (3) PCT).

2.2 The same reasoning applies mutatis mutandis for the subject-matter of independent claims **7,12** which therefore does not involve an inventive step (Article 33 (3) PCT).

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2.3 The additional features of claims **3,9,13,14,16** essentially correspond to minor modifications falling within the scope of the common practice of the skilled person and therefore do not involve an inventive step (Article 33 (3) PCT).

2.4 The subject-matter of dependent claims **2,4-6,8,10,11,15,17,18** essentially describes different examples of lexical or syntactic rules against which the generated computer code is compared.

The objective technical problem to be solved by the present invention may therefore be regarded as how to provide an automatic method to thoroughly review the generated code (see in the present application paragraph [7] of the description)

The man skilled in the art faced with problem posed would look for a solution in the field of code review tools and would therefore find **D2** ([7]).

D2 describes a tool to automatically verifies that a source code complies with a certain set of lexical or syntactic rules ([13]).
Since the tracing tool of D1 is purposed to assist the user in validating the structure of the generated code, the man skilled in the art faced with problem posed would be prompted to include the automatic code review tool of D2 in D1.
Finally, the different syntactic rules mentioned in each of the referenced dependent claims correspond to straightforward examples of rules, which the skilled person would implement, in accordance with circumstances, without the exercise of inventive skill.

The subject-matter of claims **2,4-6,8,10,11,15,17,18** therefore does not involve an inventive step (Article 33 (3) PCT).

2.5 With reference to claims **19,20**, the mere fact that the system for verifying the correctness of the generated code is applied in the field of avionics or complies with a well known standard does not involve an inventive step (Article 33 (3) PCT).

3. The subject-matter of independent claim **2**, as presently worded, is also anticipated by **D3**, which describes a system to compare a generated code with a mathematical specification generated from the model, see passages cited in the International Search

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Report.

Y. Sabbah

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